

Work Order ID 51880

Tuesday, September 08, 2009 3:02:23 PM



Page 1

Item ID: D212-664-101

Accept



Setup Start



Revision ID: C

Stop



Item Name: Crosstube Fwd

Start Date: 9/29/2009 Start Qty: 1.00



Cust Item ID:

Required Date: 9/29/2009 Req'd Qty: 1.00

Customer:

Reference:

Approvals:

Process Plan:

PL

Date:

09-9-09

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D212-664-141

Rev C

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile and create labels as per PPP D212-664-101 CHG003

5/09/09/21

HJ for BG 09/09/21

110

0.00



Pick Kit

Packaging

Memo

0.00

Packaging

Packaging

PL 9/9/21 (1)

120

0.00



BENDING MACHINE - CROSSTUBES

CNC Bend 2

Memo

0.00

CNC Alpha 160 Bender

Bend tube as per Dwg D212-664-141 using CNC bender program 212-fw and Folio FT015

B51880 D212-664-101 9-9-10

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Item ID: D212-664-101

Accept

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Item Name: Crosstube Fwd

Start Date: 9/29/2009 Start Qty: 1.00

Cust Item ID:

Required Date: 9/29/2009 Req'd Qty: 1.00

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

130

QC15- Crosstube Dimensional Check

0.00

37 8 02/09/10

QC

Memo

0.00

(X1)

/

Quality Control

140

Crosstubes

0.00

Crosstubes

Memo

0.00

1-Drill pilot holes in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549

2-Ream hole to finish size in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.

3-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-141

4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-141

MB
09-09-10

(14)

/

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Item ID: D212-664-101

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Start Date: 9/29/2009 Start Qty: 1.00

Required Date: 9/29/2009 Req'd Qty: 1.00

Reference:

Cust Item ID:

Customer:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

150



HandFXtube

Crosstubes Chemical Conversion

0.00

Memo

0.00

Hand Finishing Crosstubes

Chemical Conversion Coat within 24 hours of bending and drilling

(14)

X

MB 09-09-16

160



QC

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

Quality Control

2) 809/09/16

(X6)

X

170



Outsource2

Outsource process - NDT per QSI038 4.1

0.00

Memo

0.00

Outsource process - NDT

Liquid Penetrant Inspection as per QSI 038
Issue P/O: 10419
LPI as per ASTM 1417 Level 2
Attach copy of NDT results to work order

RP 09-9-17 O

[illegible]

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[illegible][illegible][illegible]

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Customer:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466
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Abstract

Date:

SPC (Y/N):

Date:

**Insp.
Stamp**

[illegible]

Page 12 (1)

Ensure copy of NDT results attached to work order.

[illegible]

mm aa aa 18 ①

Inspect for damage & ensure results are as per Dwg D212-664-141

Work Order ID 51880

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Item ID: D212-664-101

Accept



Setup Start



Revision ID: C

Stop



Item Name: Crosstube Fwd

Start Date: 9/29/2009 Start Qty: 1.00



Cust Item ID:

Required Date: 9/29/2009 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
200 SprayPaint	Spray Painting per QSI005 4.2 SprayPaint	0.00				<u>m</u>	<u>09</u>	<u>09</u>	<u>18</u>
	Memo	0.00							
	1-Prime inside and outside crosstube as per QSI 005 4.2 2-Paint outside crosstube with White Imron as per QSI 005 4.2								
	PRIME: Start Time: <u>10:00</u> Finish Time: <u>10:30</u>								
	PAINT: Start Time: <u>2:30</u> Finish Time: <u>3:30</u>								
210 QC	QC14- Inspect Spray Paint	0.00							
	Memo	0.00							
	Then, Wrap in plastic bag to protect from scratches								

85 09.09.20

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Item ID: D212-664-101

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Setup Start



Revision ID: C

Stop



Item Name: Crosstube Fwd

Start Date: 9/29/2009 Start Qty: 1.00



Cust Item ID:

Required Date: 9/29/2009 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
220 Crosstubes	Crosstubes	0.00				<u>ml</u>	<u>09</u>	<u>09</u>	<u>20</u>
Crosstubes	Memo 1- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe 2-Install supports with magnobond as per QSI 015 Adhere for for 12 Hrs A/R 6398 Magnobond Batch: <u>111249</u> <u>exp 10-06-01</u>	0.00							
230 QC	QC5- Inspect part completeness to step on W/O	0.00							
Quality Control	Memo <u>> 8/15/21</u>	0.00				<u>(X1)</u>	<u>f</u>		
240 Packaging	Pick Kit	0.00							
Packaging	Memo <u>Pc 9/15/21</u>	0.00							<u>U</u>

Work Order ID 51880

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Item ID: D212-664-101

Accept

Revision ID: C

Item Name: Crosstube Fwd

Start Date: 9/29/2009 Start Qty: 1.00

Required Date: 9/29/2009 Req'd Qty: 1.00

Reference:

Cust Item ID:

Customer:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	----------------	--------------	--------------	---------------	---------------	------------------	----------------

250

QC4- 100% Inspect kits for completeness

0.00



QC

Memo

0.00

Quality Control

27 Ser/02/21

40 - 1

260

Packaging

0.00



Packaging

Memo

0.00

Packaging

Identify and pack for shipping as per PPP D212-664-101

1 R

09/15/21

270

QC21- Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

09/09/21

MF 09-09-21

Picklist Print

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Page 1

4

Work Order ID: 51880



Parent Item: D212-664-101RevC



Parent Item Name: Crosstube Fwd

Start Date: 9/29/2009

Required Date: 9/29/2009

Comments:

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
D212-664-101TRNRevC		Manufactured	No			110	Each	2.0000	1.0000			
										B-51478 MB 09-09-09		
Crosstube Turning Detail												

Warehouse
Location

Loc Qty

Loc Code

Main Warehouse

FG

2

51478

1

51479

1

D3595-063-450RevA

Manufactured

No

230

Each

81.1789

4.2105



RT 09-09-20

RUBBER CUSHION

Warehouse
Location

Loc Qty

Loc Code

Main Warehouse

LG

74

50953

74

Main Warehouse

ST

7.1789

38959

2

43210

4.8

46465

0.3789

X2

X2

X2

Picklist Print

Page 2

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Work Order ID: 51880



Parent Item: D212-664-101RevC



Parent Item Name: Crosstube Fwd

Start Date: 9/29/2009

Required Date: 9/29/2009

Comments:

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
MS21920-25		Purchased	No			220	Each	167.0000	4.0000			
Clamp(per MIL-DTL-8783C)												

09-09-20

Warehouse
Location

Loc Qty

Loc Code

Main Warehouse

ST

167

107456

2

108111

3

108975

17

109181

48

109644

10

111282

12

111429

25

112495

50

x4 10

D2893-1RevB

Manufactured No

220

Each

52.0000

2.0000



2.75 Support

09-09-20

Warehouse
Location

Loc Qty

Loc Code

Main Warehouse

ST

52

25657

6

46488

8

47109

18

47637

20

x2 10

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Shop Packet Print

Page 2

Picklist Print

Tuesday, September 08, 2009 3:02:31 PM

Work Order ID: 51880



Parent Item: D212-664-101RevC



Parent Item Name: Crosstube Fwd

Start Date: 9/29/2009

Required Date: 9/29/2009

Comments:

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
D3428-1RevA Placard		Manufactured	No			240	Each	31.0000	1.0000	✓		

<u>Warehouse</u>	<u>Loc Qty</u>	<u>Loc Code</u>
<u>Location</u>		
Main Warehouse		
ST096	31	
50790	31	

AN6-35A BOLT		Purchased	No			240	Each	94.0000	4.0000	✓		
---------------------	--	-----------	----	--	--	-----	------	---------	--------	---	--	--

<u>Warehouse</u>	<u>Loc Qty</u>	<u>Loc Code</u>
<u>Location</u>		
Main Warehouse		
ST	94	
112314	94	

AN6-36A Bolt		Purchased	No			240	Each	129.0000	4.0000	✓		
---------------------	--	-----------	----	--	--	-----	------	----------	--------	---	--	--

<u>Warehouse</u>	<u>Loc Qty</u>	<u>Loc Code</u>
<u>Location</u>		
Main Warehouse		
ST	129	
109632	1	
110382	2	
111650	26	
112314	100	

Picklist Print

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Work Order ID: 51880



Parent Item: D212-664-101RevC



Parent Item Name: Crosstube Fwd

Start Date: 9/29/2009

Required Date: 9/29/2009

Comments:

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Remaining Qty To Pick	Qty Issued	Date Issued	Status
MS21042L6 Nut		Purchased	No			240	Each	725.0000	6.0000 ✓			

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST

725

105077

22

110002

5

111548

98

111578

400

112492

200

m111548

AN960JD616 18~

Purchased

No

240

Each

716.0000

18.0000 ✓



Washer

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST

716

107242

3

107959

6

109371

8

110704

23

111193

10

111607

4

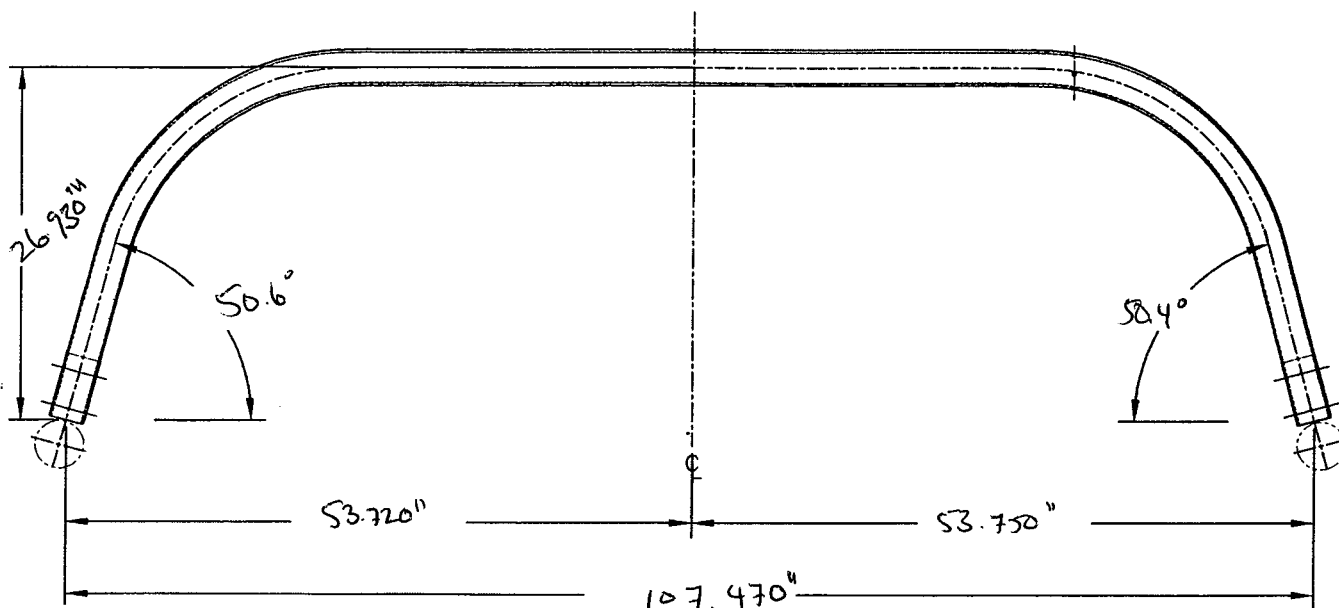
112314

662

m112314

DART AEROSPACE LTD		Work Order:	51880
Description: Crosstube High Fwd (205/212/412)		Part Number:	D212-664-101
Inspection Dwg: D212-664-141 Rev: C		Page 1 of 1	

Required Dimension	Min	Max
Height	26.79	27.05
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.7



Comments

QC15 Inspection	S
Date	09/07/10

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.05.31	Dimensions updated per Dwg Rev C	KJ/JM	



DESIGN PH	DRAWN BY PH	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED GP	APPROVED [Signature]	DRAWING NO. D212-664-141	REV. C SHEET 1 OF 3
DATE 07.03.08		TITLE XTUBE ASS'Y (205/212/412 HI FWD) NTS	
A	00.12.12	NEW ISSUE	
B	05.02.04	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	
C	07.03.08	REMOVE -851 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	

RELEASED

07.04.24 **[Signature]**

DEO ATTACHED

Qty	Part Number	Description
X	D212-664-141	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)
1	D6005-128	CROSSTUBE
2	D2893-1	SUPPORT
4	D3595-063-450	RUBBER CUSHION
4	MS21920-25	CLAMP (OR MS21920-26)
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

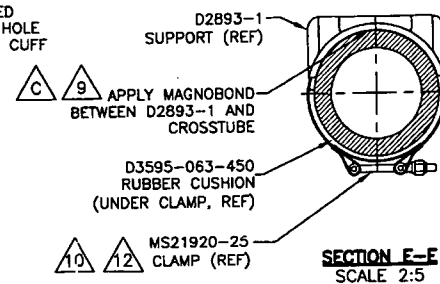
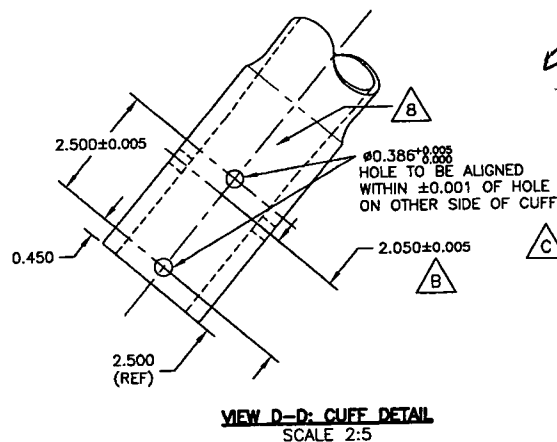
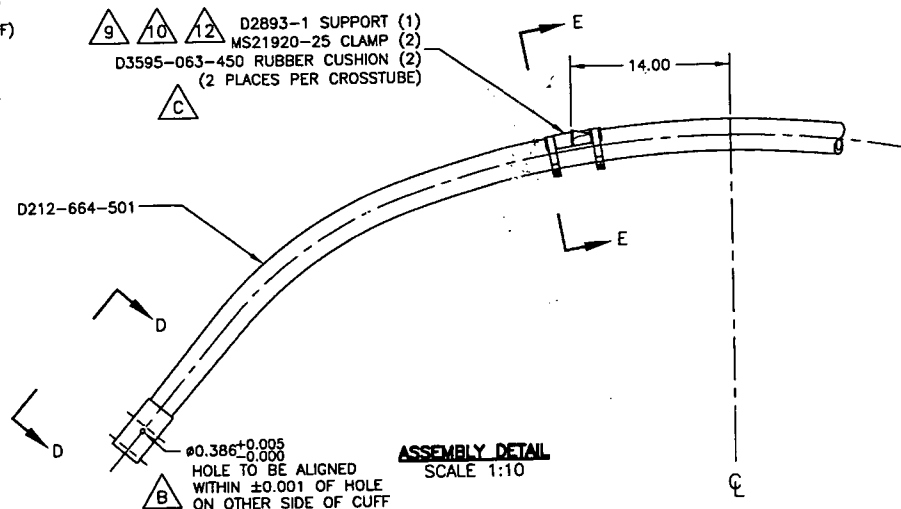
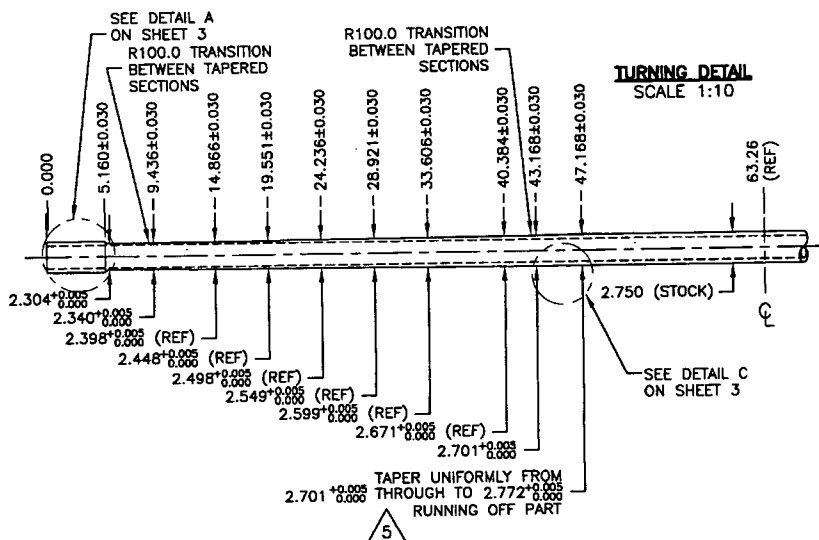
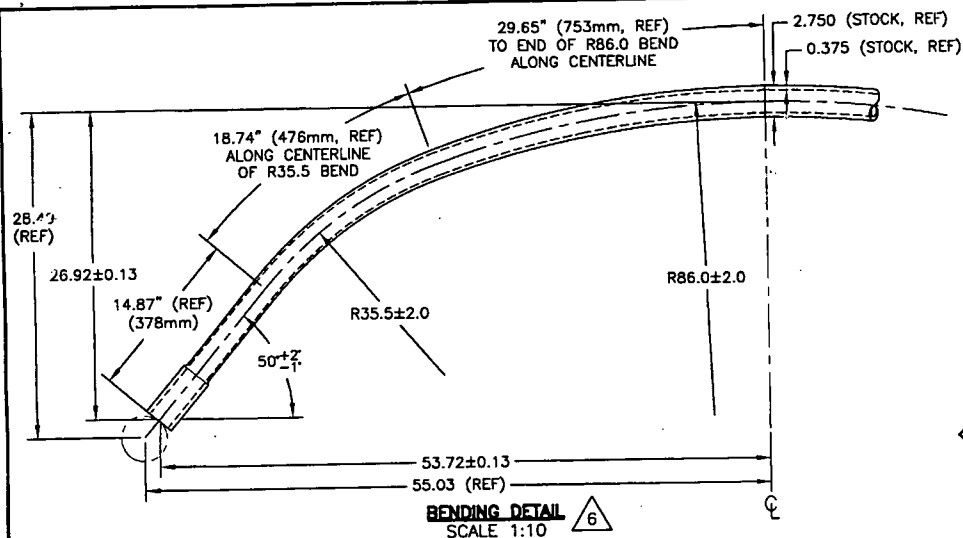
GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6005-128
FINISHED LENGTH = 126.51±0.020
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 10) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2893-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT
- 11) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 12) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

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COPYRIGHT © 2000 BY DART AEROSPACE LTD.		DESIGN	PH	DRWN BY	PH	DART	DART AEROSPACE LTD. WARRICKBURGH, ONTARIO, CANADA
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		DATE	07.03.08	TITLE		XTUBE ASS'Y (205/212/412 HI FWD)	SHEET 2 OF 3 SCALE 1:10

RELEASED
07.24.08
DEO ATTACHED

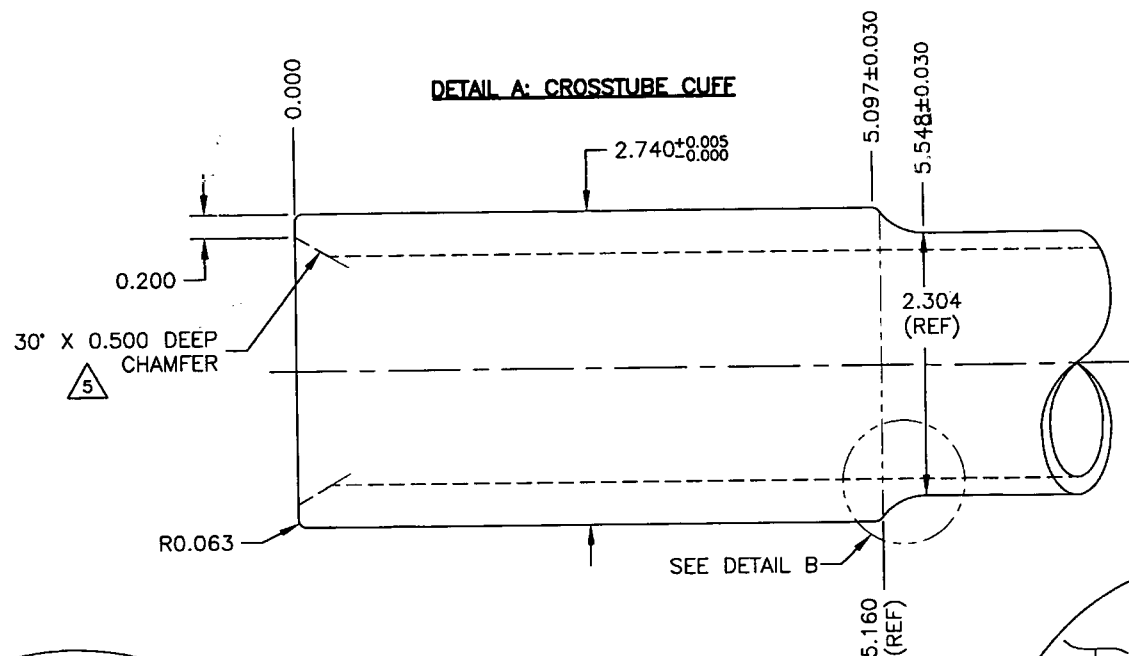
51880

RELEASED
9.04.24 LP
PER ECN 997

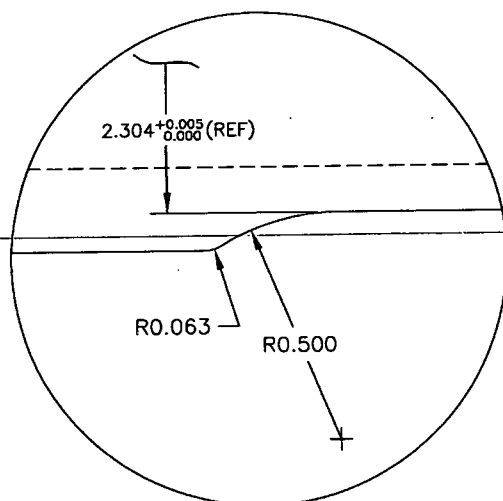
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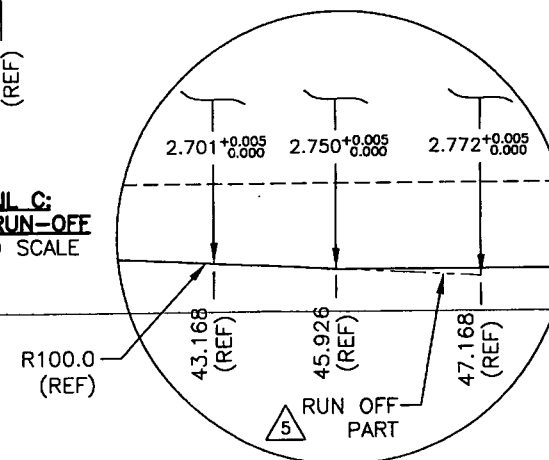
DETAIL A: CROSSTUBE CUFF



DETAIL B: CUFF
TRANSITION
SCALE 4:1



DETAIL C:
TAPER RUN-OFF
NOT TO SCALE



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DESIGN PH	DRAWN BY PH	DART	DART AEROSPACE LTD. WARRICKSURY, OXFORD, CANADA
CHECKED J	APPROVED J	DRAWING NO. D212-664-141	REV. C SHEET 3 OF 3
DATE 07.03.08	TITLE XTUBE ASS'Y (205/212/412 HI FWD)	SCALE 1:1	

DRAWING NO. D212-664-141	TITLE CROSSTUBE	REV. C	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-141-C-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>AD</i>	CHECKED <i>AD</i>	MFG. APPR. <i>AD</i>	APPROVED <i>AD</i>		DE APPR. <i>AD</i>		
DATE 09.05.01	DATE 09.06.15	DATE 09.06.15	DATE 09/06/16		DATE 09/06/16		

CHANGE:

ADD THE FOLLOWING CROSSTUBE ASSEMBLY:

Part Number	Description
D212-664-141B	CROSSTUBE ASSEMBLY (214 HIGH FWD)

THE D212-664-141B CROSSTUBE HAS THE SAME PARTS LIST AS THE D212-664-141 CROSSTUBE. HOWEVER, INSTALL THE SUPPORTS AS SHOWN IN FIGURE 1 OF THIS ENGINEERING ORDER. THE NEW KIT IS OTHERWISE ASSEMBLED PER THE D212-664-141 CROSSTUBE.

RELEASED
09/06/22

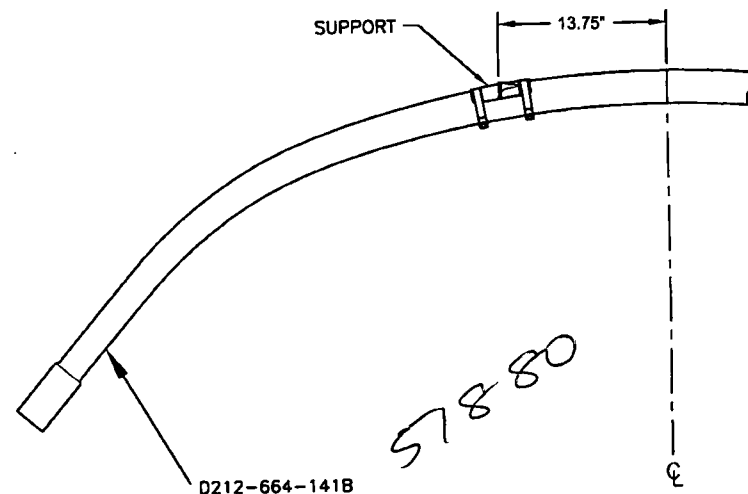


FIGURE 1 - SUPPORT INSTALLATION

DART AEROSPACE LTD.

IIN-D212-664

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5.0 PARTS LIST

5.1 HIGH GEAR CROSSTUBES

Item	-101	-201	-203	Part Number	Description
	X			D212-664-101	CROSSTUBE INSTALLATION, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD
		X		D212-664-201	CROSSTUBE INSTALLATION, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT
			X	D412-664-203	CROSSTUBE INSTALLATION, 412 HIGH AFT
1	1			D212-664-141	CROSSTUBE ASSEMBLY, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD
2		1		D212-664-241	CROSSTUBE ASSEMBLY, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT
3			1	D412-664-243	CROSSTUBE ASSEMBLY, 412 HIGH AFT
10	2			* D2893-1	SUPPORT
11	4			* D3595-063-450	RUBBER CUSHION
12	4			* MS21920-25	CLAMP (OR MS21042-26)
13	4			AN6-35A	BOLT
14	4			AN6-36A	BOLT
15	6			MS21042L6	NUT (OR MS21042-6)
16	18			AN960JD616	WASHER
20		2		* D2940-1	SUPPORT
21		4		* D3595-063-530	RUBBER CUSHION
22		4		* MS21920-28	CLAMP (OR MS21042-30)
23		4		AN6-40A	BOLT
24		2		AN6-41A	BOLT
25		6		MS21042L6	NUT (OR MS21042-6)
26		18		AN960JD616	WASHER
30			1	* D2896-1	SUPPORT
31			2	* D2856-600-1009	ABRASION STRIP
32			2	* D3595-063-570	RUBBER CUSHION
33			4	* MS21920-28	CLAMP
34			2	* MS21920-30	CLAMP (OR MS21042-32)
35			4	AN6-40A	BOLT
36			2	AN6-41A	BOLT
37			6	MS21042L6	NUT (OR MS21042-6)
38			18	AN960JD616	WASHER
39			2	* D3189-1	CHAFING SHIELD
50	1	1		D3428-1	PLACARD

*REFERENCE ONLY. PARTS ARE INCLUDED IN D212-664-141/-241 OR D412-664-243 ASSEMBLIES ABOVE
NOTE: KITS INCLUDE EXTRA HARDWARE FOR COMPATIBILITY WITH BOTH DART AND BELL/AA
SKIDTUBES.

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Revision: F
Date: 08.09.05



LIQUID PENETRANT TEST REPORT

P- 0913

PAGE 1 OF

CLIENT Dart Aerospace DATE Sept 17th 2009 TIME AM ☒ F
ATTENTION Linda Lucelle ACUREN JOB NO. 188-09-1556
ADDRESS 1270 Aberdeen St. POWO No. 10419
Hawkesbury WORK LOCATION Hawkesbury
ACCEPTANCE STD. ASTM 1417/QS1038 REV./DATE 200
PROJECT x-Tubes, 12 studs and 31 sleeves
ITEM(S) EXAMINED Sob #'s 50745, 51772, 50984, 50985, 51877, 51880

JOB DESCRIPTION PROCEDURE No. LT-0002 REV./DATE TECHNIQUE No. LT-TECH 2 REV./DATE
PART NO. D3689-1, D3691-1, D412-664-203, D212-664-101 MATERIAL ALODINED ALUM. THICKNESS
SCOPE WET FLOURESCENT LIQUID PENETRANT INSPECTION CARRIED OUT ON
100% EXTERNAL SURFACE

TEST DETAILS

METHOD <input checked="" type="checkbox"/> FLUORESCENT <input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH <input type="checkbox"/> SOLVENT REMOVABLE <input type="checkbox"/> POST EM
FAMILY BRAND <u>MAGNAFLUX</u>	BLACK LIGHT S/N <u>8170</u> <input checked="" type="checkbox"/> OUTPUT > 1000 μ W/cm ² <input type="checkbox"/> AMBIENT
PENETRANT <u>ZL67</u> MINIMUM DWELL TIME <u>45</u> MIN.	LIGHTING EQUIP. <input checked="" type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT <input type="checkbox"/> OUTPUT > 100 fc @
PENETRANT REMOVER <u>H₂O</u> MINIMUM DRY TIME <u>>10</u> MIN.	OTHER <u>CAL # JUNE 09</u>
DEVELOPER <u>SKDS2</u> MINIMUM DWELL TIME <u>10</u> MIN.	LIGHT METER S/N CAL DUE DATE <u>DEC</u>
DEVELOPER TYPE <input checked="" type="checkbox"/> NON AQUEOUS <input type="checkbox"/> AQUEOUS <input type="checkbox"/> DRY	

TEST SURFACE

SURFACE CONDITION ☐ AS GROUND ☐ AS WELDED ☒ MACHINED ☐ SHOT BLASTED ☐ CLEAN BARE M
SURFACE TEMPERATURE ☐ < -4°C/ 20°F ☐ -4°C/ 20°F TO 10°C/50°F ☐ 10°C/50°F TO 52°C/125°F ☐ > 52°C/125°F

RESULTS- (☐ METRIC ☐ IMPERIAL)

WET FLOURESCENT LIQUID PENETRANT INSPECTION CARRIED OUT ON 100% EXTERNAL SURFACE ON:		No indication found at the of the inspection. ACCEPTABLE TO STANDARD M/ 09 09 18
31 Sleeves ID: D3689-1	✓	
12 Studs ID: D3691-1	✓	
2 x Crosstube ART ID: D412-664-203	✓	
2 x Crosstube Fwd ID: D412-664-101	✓	

Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressed that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions and data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care

In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE <u>C. LADORE</u> <u>Charles Ladore</u>	DTR #
TECHNICIAN (SIGNATURE): <u>Frederick Chagnon</u>	REPORT REVIEWED BY:
NAME (PRINT): <u>Frederick Chagnon</u>	NAME IN
1 st TECHNICIAN CGSB LEVEL <u>II</u> SNT LEVEL <u>II</u> CGSB REG. NO. <u>10560</u>	2 nd TECHNICIAN CGSB LEVEL SNT LEVEL CGSB REG. NO.